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AIRPORT NOISE REGULATORY PROCESS

Proposal and Announcement of Public Hearing

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[14 CFR Part 140]

[Docket No. 16279; Notice No. 76-24]

AIRPORT NOISE REGULATORY PROCESS

Proposed Regulations Submitted to the FAA By the Environmental Protection Agency

This notice of proposed rulemaking contains recommended regulations submitted by the Environmental Protection Agency (EPA) to the Federal Aviation Administration (FAA), pursuant to section 611(c)(1) of the Federal Aviation Act of 1958, as amended by the Noise Control Act of 1972 (Pub. L. 92-574). Section 611(c)(1) of the Federal Aviation Act of 1958 provides that EPA shall submit to the FAA recommended regulations to provide such control and abatement of aircraft noise and sonic boom as EPA determines is necessary to protect the public health and welfare. That section also provides that the FAA "shall consider such proposed regulations submitted by EPA under this paragraph and shall, within thirty days of its submission to the FAA, publish the proposed regulations in a notice of proposed rulemaking." This notice is published pursuant to that provision of law.

The EPA recommended regulation contained in this notice of proposed rulemaking (NPRM) proposes to amend Subchapter G of the Federal Aviation Regulations (14 CFR Chapter I) to establish a new Part 140 to prescribe (as stated by the EPA) "procedures for the development, approval, and implementation of an Airport Noise Abatement Plan for airports reqiured to be certificated under Part 139. This plan would constitute an amendment to the existing Airport Operating Certificate."

Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Communications should identify the docket number and be submitted in duplicate to the Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket, AGC-24, 800 Independence Avenue SW., Washington, D.C. 20591. Comments on the overall environmental aspects of the proposed rule are specifically invited. Information on the economic impact that might result because of the adoption of the proposed rule is also requested. All communications received by the FAA on or before March 24, 1977, will be considered by the Administrator before taking action on the proposed rule. The proposal contained in this notice may be changed in the light of the comments received. All comments will be available, both before and after the closing date for comments, in the FAA Rules Docket for examination by interested persons. The EPA has requested that an additional information copy of each public comment be sent to: U.S. Environmental Protection Agency, Office of Noise Control, AW-471, Attention: Docket No. ONAC 76-13, 401 "M" Street SW., Washington, D.C. 20460. However, to ensure consideration as part of the regulatory process of the FAA, each comment must be submitted to the FAA Rules Docket.

Any person may obtain a copy of this notice of proposed rule making (NPRM) by submitting a request to the Federal Aviation Administration, Office of Public Affairs, Attention: Public Information Center, APA-430, 800 Independence Avenue SW., Washington, D.C. 20591, or by calling (202) 426-8058. Communications must identify the notice number of this NPRM. Persons interested in being placed on a mailing list for future NPRMs should also request a copy of Advisory Circular No. 11-2 which describes the application procedure.

A separate notice of hearing, published today in the "Notices" section of the FEDERAL REGISTER, announces that, pursuant to section 611(c) of the Federal Aviation Act of 1958, as amended, the FAA will conduct a public hearing in Washington, D.C., on January 17, 1977, to receive oral, as well as written, comments regarding the proposals contained in this notice of proposed rule making.

The following EPA opinions, conclusions, and proposed regulatory language are published verbatim as received from EPA by the FAA on October 26, 1976:

EPA PROPOSAL AS SUBMITTED TO FAA

In accordance with a recommendation made by the Administrator of the Environmental Protection Agency, pursuant to Section 7 of the Noise Control Act of 1972, the Federal Aviation Administration is considering the adoption of a new Part 140 to the Federal Aviation Regulations prescribing procedures for the development, approval, and implementation of an Airport Noise Abatement Plan for airports required to be certificated under Part 139. This plan would constitute an amendment to the existing Airport Operating Certificate.

LEGISLATIVE HISTORY

Under the requirements of section 7(a) of the Noise Control Act of 1972 (Pub. L. 92-574; 86 Stat. 1239) The Administrator of the Environmental Protection Agency conducted a study of the adequacy of Federal Regulation of aircraft and airport noise and submitted a report thereon to the Congress (Report on Aircraft/Airport Noise, Senate Committee on Public Works, Serial No. 93-8, August 1973). Under section 611 of the Federal Aviation Act, as amended by the Noise Control Act of 1972, the Administrator of the EPA is also required to submit to the Federal Aviation Administration proposed regulations to provide such control and abatement of aircraft noise and sonic boom (including control and abatement of aircraft noise through the exercise of any of the FAA's regulatory authority over air commerce or transportation or over aircraft or airport operations) as the Administrator of the EPA determines is necessary to protect the public health and welfare. In accordance with the foregoing requirement, the EPA published in the FEDERAL REGISTER on February 19, 1974 (39 FR 6112), a "Notice of Public Comment Period" containing a synopsis of the proposed rules it was considering to achieve a level of aircraft noise control and abatement satisfactory for the protection of the public health and welfare. The proposed aircraft and airport rules were divided into three categories: flight procedures for noise control, source noise control, and airport operations and planning for noise control. EPA has already proposed the following rules to the FAA:

Title	Date to FAA	NPRM No. Publication Date Federal Register	Date of hearings
1. Noise standards for propeller driven small airplanes.	Dec. 6, 1974	74-39, Jan. 6, 1975, 40 FR 1061	Mar. 3, 1975
2. Noise abatement minimum altitudes for turbojet airplanes in terminal areas.	do	74-40, Jan. 6, 1975, 40 FR 1072	Mar. 5, 1975
3. Civil subsonic turbojet engine-powered airplanes: noise retrofit requirements.	Jan. 28, 1975	75-4, Feb. 26, 1975, 40 FR 8218	Mar. 18, 1975
4. Fleet noise level requirements	do	75-6, Feb. 26, 1975, 40 FR 8222	Apr. 17, 1975
5. Civil supersonic airplanes	Feb. 27, 1975	75-15, Mar. 28, 1975, 40 FR 14093	May 16, 1975 May 22, 1975
6. Reduced flap setting noise abatement approach for turbojet engine-powered airplanes.	Aug. 29, 1975	75-35 I, Sept. 25, 1975, 40 FR 44256.	Nov. 5, 1975
7. Visual 2-segment noise abatement approach for turbojet engine-powered airplanes.	Aug. 28, 1975	75-35 II, Sept. 25, 1975	Do.
8. 2 segment ILS noise abatement approach for turbojet-engine powered airplanes.	Aug. 29, 1975	75-35 III	Do.
9. Airplane noise requirements for operation to or from U.S. airports.	Jan. 13, 1976	76-1, Feb. 12, 1976, 41 FR 6270	Apr. 5, 1976

The EPA is currently preparing the following further regulations which may be submitted to the FAA in the near future.

Noise Levels for Turbojet Powered Airplanes and Large Propeller Driven Airplanes

Modifications to Noise Measurement and Evaluation Procedures for Aircraft Type & Airworthiness Certification

Aircraft Takeoff Procedures for Noise Control

All of the above proposals are directed at source noise control, to be complied with by manufacturers, or operational procedures, to be complied with by air carriers. In its report to Congress, the EPA emphasized that a full aviation noise control program would require action by airport proprietors as well. The rule which is the subject of this notice of proposed rulemaking, identified as the Airport Noise Regulation, would implement a comprehensive planning and abatement process at the nation's airports serving certificated air carriers. This proposed rule is the result of an intense investigation and analysis over the past two years and pilot projects at eight domestic airports. The key elements of the process consist of: (1) Determining boundary line noise levels at the airport

in order to determine the extent of planning needed at the facility, (2) development of a noise abatement plan by the airport proprietor, (3) presentation of the plan to all interested parties at a public hearing, (4) submission of the plan, revised pursuant to public hearing as appropriate, to the Administrator (FAA) for his review, (5) inclusion of a plan as part of amended Airport Operating Certificate, and (6) implementation of the plan by the proprietor. This regulatory precedure is therefore established under Title 14 of Chapter I of the Code of Federal Regulations, Part 140, and would provide for an amendment to airport operating certificates issued pursuant to Part 139.

The FAA's authority to promulgate these requirements derives from the Federal Aviation Act of 1958, as amended, and the Airport and Airway Development Act of 1970. Section 611 of Title VI of the Federal Aviation Act of 1958, as amended (Pub. L. 90–411), provides in pertinent part that the Administrator of FAA shall prescribe and amend such rules as he finds necessary for the control and abatement of aircraft noise, including the application of such rules in the issuance or amendment of any certificate authorized by Title VI of that Act. Under section 612 of that title, as amended by the Airport and Airway Development Act of 1970 (Pub. L. 91–258), the Administrator of FAA is authorized to issue airport operating certificates to airports serving air carriers certificated by the Civil Aeronautics Board, and to establish minimum safety standards for the operation of those airports.

Congress has repeatedly expressed its intent that airport planning and development be consistent with environmental considerations. The Airport and Airway Development Act of 1970 (Pub. L. 91–258) provides for Federal aid to airport development projects, including the location of an airport, runway, or runway extension. Encompassing the process of application, hearing, and approval at all levels for airport development projects is the declaration of national policy that those projects provide for the protection and enhancement of the natural resources and the quality of environment of the nation. In this respect the Secretary of Transportation may not approve an airport development project found to have an adverse environmental impact unless he finds that there is "no feasible and prudent alternative", and that "all possible steps have been taken to minimize" such adverse effects. (49 U.S.C.A. 1716 (c)(4)).

Section 16(a) of the Airport and Airway Development Act of 1970 also requires any development to be in accordance with standards established by the Secretary of the Department of Transportation, including standards for site location and airport layout. In addition, under section 18 of that Act before the Secretary approves an airport development he must receive satisfactory assurance that appropriate action, including the adoption of zoning laws, has been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of airport operations. Finally, that Act provides in pertinent part that no airport development project may be approved by the Secretary of Transportation unless he is satisfied that "fair consideration has been given to the interest of the communities in or near which the project may be located." "Fair consideration" as used in that provision of the Act is based upon criteria designed to "provide for the protection and enhancement of the natural resources and the quality of the environment of this nation." (49 U.S.C.A. 1716(c)(3)).

Section 13 of the Act also authorizes the FAA to make grants to public and planning agencies for prepartion of airport master plans. Under this Planning Grant Program, Federal grants of up to two-thirds of the eligible costs are available, with no state being eligible for more than 7.5 percent of the funds available in any one fiscal year. All grants are subject to the National Environmental Policy Act of 1969; and section 102(2)(C) of the Act requires an environmental impact statement when any Federal action would constitute a major action significantly affecting the environment.

In summary, the foregoing statutory provisions establish a firm foundation for the formulation of airport and aircraft noise abatement rules and for requiring airports to prepare and implement noise abatement plans as provided for in this proposed regulation.

The Problem

The airport noise problem results primarily from three factors: (1) The introduction of jets into the air carrier fleet in 1959, (2) airport encroachment by neighboring communities, and (3) airport expansion and operational increases and changes.

A portion of residential areas currently exposed to high levels of aircraft noise were developed before 1959 and were constructed, for the most part, in areas not then seriously impacted by aircraft noise. The rapid replacement of propeller driven aircraft by jets during the 1960's increased the extent and intensity of the noise problem.

However, in many cases a considerable portion of land already impacted by aircraft noise was subsequently developed for residential uses. By 1964 the FAA had developed the "composite noise rating" system (CNR) which permitted the prediction of community annoyance as a function of the number and type of aircraft operations and the time of day during which they occur. Even with the availability of CNR, local government bodies continued to permit incompatible development.

An increase in aircraft operations coincided with the replacement of propeller aircraft by jets. Runways and flight tracks at many large and severely encroached airports become saturated and rapid airport expansion resulted in additional runways and flight tracks and noise complaints.

Among the more serious constraints to the development of a workable airport noise regulation are: (1) The individuality of each airport/community conflict situation, (2) the attraction which airports provide for incompatible development, (3) complexities associated with noise impact assessment, and (4) ambiguities in the judicial and political allocation of authority, accountability, and liability. The availability of noise abatement options, often thought to be the major constraint, is not in EPA's judgment a serious impediment to substantial improvement in the noise environment around most of the nation's airports. There are many cost-effective noise abatement actions which can be taken, provided the constraints identified above can be dealt with. This proposed regulation provides a simple approach to noise impact assessment and establishes a planning and decision-making process designed to deal with the other enumerated constraints.

Each airport is an individual case requiring special consideration. The types of airport proprietorship, extent of fragmentation of local government, the operational mission and size of airport and the pattern of surrounding land use are presented in an astounding number of combinations. Thus, a national regulation must make many simplifying generalizations to be workable. The tradeoffs between equitable uniformity and reasonable flexibility have been difficult to make and undoubtedly have impeded progress more than any other single factor. Some actions clearly should be taken on a nationally uniform basis. Others are best suited to site specific application, especially where a national rule would of necessity have to be a "lowest common denominator" approach which would leave serious noise problems unabated at a significant number of airports.

Airport proprietorship may be public, quasi-public, or private. A typical form of public proprietorship is exemplified by the municipal department of airports; it varies depending on the form of local government in question, but many are line agencies directly accountable to a chief executive, council, or commission. Quasi-public airport proprietorship is typified by the port authority or commission and is subject to all of the variations associated with special purpose forms of government. Private proprietorship is rare among airports serving certificated air carriers, with Burbank Airport (which is presently owned by Lockheed Air Terminal Corp.) providing the only example.

The operational mission and size of an airport also present a set of limiting factors, the most important of which are related to the national or international status of the airport, the amount of air cargo shipped, the annual number of operations, the type of aircraft accommodated, the physical size of the airport, and the degree of encroachment. Large international airports and airports with high volumes of air cargo operations re-

quire a higher percentage of night operations and are less amenable to night curfew. Adjoining land use patterns also create a wide variety of constraints. Some airport related activities and the community infrastructure necessary to support them are noise sensitive, for example, residential land uses, schools, and theaters. The spatial distribution of such incompatible development varies considerably from airport to airport; encroachment may be partial or circumferential gradually increasing or decreasing in intensity as a function of distance from the airport. In addition, the nature of housing types and population densities which are critical determinants of background noise levels, as well as structural absorption and human sensitivity also vary.

The airport is an example of an essential land use which must be effectively integrated into the urban economy it serves, but which is incompatible with the land use that, if unconstrained, tends to develop in the impacted land area.

There have also been many important constraints associated with the art of aircraft noise impact assessment. All but the most experienced practitioners have difficulty deciphering the abbreviations and acronyms which abound in the field of psychoacoustics. Planners and airport proprietors have digested dB, dBA, dBD, PNL, EPNL, SEL, SENEL, CNR, NEF, CNEL, ASDS L., and L., with patience and understandable confusion.

Finally, a remarkable court history has resulted in a type of legal constraint which is so pervasive and important that it deserves separate and special consideration—the legal liability for aircraft noise effects. The liability for the aircraft noise effects experienced by property owners has been left by the courts to the airport proprietor, who in the past has frequently been held to have limited or no authority to abate aircraft noise. This has created a serious dilemma for airport proprietors, the Federal Aviation Administration, and local land use decisionmakers.

The proprietor's dilemma arises from the fact that the aircraft serving his airport are engaged in interstate commerce and are flying in Federally controlled airspace. Thus, many attempts to implement noise abtement strategies have been seen as interfering with interstate commerce or as being null and void because of Federal preemption. If litigation is pending against the proprietor, it is likely that he will be reluctant to reveal aircraft noise forecasting information for fear that it will be used against him in court. This confused and paradoxial situation has dissuaded many airport proprietors from moving to reduce noise and has encouraged them to keep a low profile and to concentrate on those tasks related to the day-to-day running of the airport.

Local governments face their own peculiar dilemma. Noise has simply not been a priority consideration in most local land use decisions. Even where the prevention of encroachment does receive priority local attention, many forces operate to mitigate its effectiveness. Every local governing body must face the difficult choice between (1) acquiring rights in property for a public purpose at considerable expense, or (2) regulating land use without compensation in the name of protecting the public health, safety, and welfare. At some point, increasing regulatory restrictions placed on the use of property may constitute a whole or partial taking of property, in which case compensation is necessary.

The uncertainty associated with the legal authority, accountability, and liability for noise has been compounded by the large number of diverse groups and their respective interests which play a major role in noise and noise abatement around airports. Included in the involved groups are the Federal and State governments, aircraft manufacturers, air carriers, owners of general aviation aircraft, airline pilots, land developers, home owners around the airport, the airport proprietor, local land use planners, and city councils of those communities either benefiting from or adversely affected by the airport. In the past, no one group has wanted to shoulder the principal burden of noise abatement. The unhappy result has been that noise abatement actions which could have been taken have not been, and the neighbors of our nation's airports have continued to suffer.

The Regulatory Rationale

Despite the foregoing constraints there are many noise abatement actions that can be taken by various levels of government, the public, and the aviation industry, including airport proprietors. The history of noise control indicates that little is accomplished, notwithstanding large expenditures of money, unless a comprehensive approach is taken that considers all of the elements and participants involved in a particular situation and their relationship to each other. Nowhere is there a single private or governmental entity that has the complete capability, legally and technically, to address the entire aviation noise problem. The EPA believes that a Federal/State/local program for airport noise control and abatement, established under uniform procedures prescribed by the Federal Government for the coordination, consideration, and resolution of a particular airport/community noise problem is needed: That is the purpose of this proposed procedure. EPA has already made a number of regulatory proposals which, if adopted by the Federal Aviation Administration, will provide Federal leadership on a national basis for noise abatement. However, additional noise abatement actions need to be taken at the local level. In the past, progress in such abatement actions has suffered from a lack of an overall airport noise abatement strategy which evaluates the available options and chooses those which are the most cost-effective for the protection of public health and welfare. The Environmental Protection Agency believes that such a noise abatement strategy for a specific airport can best be developed by the airport proprietor in cooperation with the other interested groups. To this end, this regulation requires that the airport proprietor evaluate each of the following possible noise abatement actions and develop a noise abatement program for his airport which provides for the protection of the health and welfare of the surrounding community:

1. Takeoff and landing noise abatement procedures for aircraft.
2. Limitations on the use of aircraft which do not meet the certification noise limits of Federal Aviation Regulation 36.
3. Noise abatement preferential runway systems.
4. Glide slopes and glide slope intersections for landing configuration.
5. Flight tracks.
6. Approach paths.
7. Landing paths.
8. Limitations on the class of aircraft using the airport.
9. Shifting aircraft to neighboring airports.
10. Location of run-up areas.
11. Operational limitations/curfews.
12. Priority landing directions for all aircraft.
13. Landing fees based on performance specifications.
14. Landing fees based on noise emission characteristics.
15. Compatible use of impacted land.
16. Other actions which would have a beneficial impact on public health and welfare.
17. Other actions recommended for analysis by the FAA or EPA for the specific airport.

The depth of the analysis required of an individual airport proprietor will depend on the extent of the noise problem at that particular airport. For most airports in the country, the actual amount of planning and analysis required will be small. The EPA has prepared, and will furnish, a manual technique for evaluating noise abatement options; this technique, which does not require the use of computers, can be used at most certificated air carrier airports.

In order to carry out this abatement planning and implementation effectively the airport proprietor must have a planning process by which he can determine the most effective means of noise abatement in his particular situation and by which there can be a meaningful dialogue with those—local governing bodies, airport neighbors, airport users, local Chambers of Commerce, and airlines, among others—who want and should have a role in determining what is to be done at the airport to abate noise.

EPA has designed and developed an environmental aircraft noise impact assessment methodology for airports to meet those needs. This methodology, called the Airport Noise Evaluation Process (ANEP) is set forth in Appendix A to this regulation. This process has the very important quality of providing for the display of the relative effectiveness of various noise abatement actions in a form which is understandable to both technical and non-technical persons, including the airport's neighbors.

The ANEP methodology is based upon the use of the Day-Night Average Sound

Level (L_{dn}) description which EPA has recommended for use in all community noise studies and planning efforts. The L_{dn} noise description is formulated to encompass all of the noise events which take place within a 24 hour period, with a penalty for nighttime noise events. Although one may argue that an averaged description which is based upon a 24 hour time period cannot fully reflect specific variations in noise level during discrete time periods, EPA believes that the use of such a formulation is warranted since (1) predicted public reaction to noise correlates well with average daily levels, and (2) data requirements for analyses by specific time periods during the day rapidly assume such awesome proportions as to render any analytical scheme unmanageable.

Under the planning process proposed herein, city councils and land use planners, as well as the people most directly affected by aircraft noise will have the opportunity to take a part in the planning and abatement process. Their effective participation is made possible by the nontechnical manner in which this methodology presents the results of the analysis. This kind of participant process is essential if the airport and the community are to continue to coexist on an amicable basis and if the growing problem of incompatible land use is to be brought under reasonable control.

Under the present proposal, every airport in the United States subject to Part 139, serving air carriers holding a certificate of public convenience and necessity from the Civil Aeronautics Board, must develop and implement a noise abatement plan. In many cases, general aviation airports also generate severe noise impacts on the airport neighbors. Thus, they will need to be brought within the regulatory process at a subsequent date. However, because only air carrier airports are presently required to have an Airport Operating Certificate under Part 139 of Title 14 of the Code of Federal Regulations and because a regulatory process such as this must start with the most serious problems, air carrier airports are the natural starting point.

A noise abatement plan must be developed and implemented under this regulation for both two years and five years from promulgation and thereafter on a continuing basis every five years.

Development of the Airport Noise Abatement Plan must be coordinated with areawide and local planning programs so that alternative noise abatement strategies under study by the airport proprietor consider and are coordinated with patterns of residential and other major land uses in the area, with other transportation facilities and public services, and with objectives, policies and programs for the area in which the airport is located. It is desirable for areawide and local planning to be integrated with noise abatement planning in all plans developed under this regulation. The regulation requires that these two types of planning be fully integrated in the plan submitted under this regulation for the second five-year period.

Methodology

It is essential that a uniform methodology be used to evaluate and describe the noise impact of present and future operations at the nation's airports and the relative effectiveness of controls which could be implemented at these airports. Such a uniform methodology will ensure consistent and equitable evaluation among all airports and will greatly simplify the decision-making process which today is plagued by numerous methodologies. The EPA-proposed methodology (Airport Noise Evaluation Process—ANEP) has the added advantage of being understandable to persons who are not trained in aviation noise matters. This is essential since noise abatement around airports requires intelligent and farsighted actions on the part of many groups of persons, many of which are not generally skilled in the intricacies of noise control, per se.

The EPA uniform methodology for conducting aircraft noise impact analyses is prescribed by the proposed regulation in detail in Appendix A. The methodology requires: (1) The delineation of all land areas exposed to aircraft noise levels in excess of 55 L_{dn}, which is the gross study area for a specified base year; (2) the projection of the incremental contribution of aircraft noise to community noise in the study area; (3) the delineation of a net study area, which is developed or developable land within the gross study area which is exposed to an increment of aircraft noise of more than 2 dB (This eliminates from the study area land whose noise levels would not be significantly affected by abatement of aviation noise.); (4) the determination of the population exposed to the aircraft increments estimated in (2); and (5) the demonstration of the beneficial effects of various noise abatement options, in terms of the reduction of noise exposure to the population. On the basis of this analysis, the airport proprietor in conjunction with the community will evaluate all options, and determine which should be included in the noise abatement implementation plan for the airport in question.

Each regulation which EPA recommends to FAA under section 611(c) of the Federal Aviation Act, as amended, must in the EPA Administrator's judgment, be necessary to protect public health and welfare. Further, under section 611(d), the FAA Administrator must consider cost, safety, the needs of air transportation in the public interest, and other factors in addition to the protection of public health and welfare. In pursuance of this mandate, this regulation would require that each plan provide for the noise abatement requisite to protect public health and welfare, taking into consideration the matters set forth in section 611(d) of the Act. Each plan will be different in that the measures appropriate for each airport will be determined by the characteristics of the specific site. EPA considered the desirability of specifying particular health and welfare-based boundary line standards in the body of the regulation which every airport would be required to meet. EPA determined that such national uniform standards are not appropriate to the airport noise problem. For some less-impacted airports a national uniform standard would require far less abatement than could be effectively developed for the protection of health and welfare. For other severely impacted airports, uniform national standards would result in very little improvement in health and welfare protection. Consequently, the EPA has recommended that the health and Welfare test be applied on a local basis.

In addition, this rule is to be distinguished from one which would require the airport proprietor to abate to the extent necessary to mitigate every possible impact which may have an adverse effect on the economic value of land around the airport (taking into account cost and the other section 611(d) factors). This objective, although perhaps desirable from the point of view of the individual community, is not within the authority and responsibility of the Federal Government. It can be expected that meeting the health and welfare standard of this regulation will eliminate much of the serious economic impact on the value of land around the nation's airports. A final decision regarding all the actions which will constitute an acceptable plan can best be made after an examination of the available options based on an analysis developed pursuant to the use of ANEP. However, the minimum that should be expected of a plan can be specified on a national basis for certain categories of airports based upon the experience at the eight pilot projects which EPA has conducted using the ANEP methodology.

EPA's judgment of the abatement which would be acceptable on a national basis as a minimum step toward meeting the health and welfare standard of this regulation is based on an assessment of the effectiveness and feasibility of the available options, their impact on the air transport system, and the severity of the noise problem at various classes of airports. That judgment is specified below for various classes of airports catgorized according to the severity of their noise problems and their stage of development.

With regard to the first category of airports, which at a minimum should require that all aircraft using the facility meet the 1969 Federal Aviation Regulations (FAR) Part 36 noise levels and should utilize takeoff and landing noise abatement procedures, it should be noted that EPA has proposed or will shortly propose national rules for promulgation by the FAA requiring the use of all of these abatement options on a national scale. It is EPA's recommendation that the FAA promulgate these requirements. However, if the FAA has not finally promulgated these requirements by the time that airport plans are required to be submitted under this regulation, then it is EPA's judgment that the health and welfare standard used in this regu-

lation would require the airport proprietor to implement these requirements at the categories of sites indicated below.

Additional efforts will be necessary at many airports in order to comply with the health and welfare requirement of this regulation. A conclusion as to what these additional efforts are for a particular airport should be based on the analysis of available options made pursuant to the application of the planning methodology required by this regulation (ANEP). In addition, a proprietor may, at his own discretion, decide to include even more restrictive actions in his plan in order to deal with other problems at the airport including those adverse impacts of the airport's operation on local land values not related to health and welfare.

MINIMUM ACCEPTABLE PLAN

As used in the following discussion, "community impact boundary level" means the day-night average sound level resulting solely from aircraft operations at the line established by (1) the land held in fee simple by the airport or (2) land not held in fee simple by the airport (a) provided such land is actually being used and can reasonably be expected to continue to be used in a way which is compatible with the noise levels to which it is exposed or (b) provided the development rights of such land have been purchased such that only development compatible with the airport noise levels is allowed. Land which is merely zoned for compatible use with no other legal controls or for which aviation easements have been purchased and on which incompatible land use is possible is not included in this definition of community impact boundary level. Compatibility is to be judged according to guidelines adopted from HUD Report TE/NA-472, November 1972, "Aircraft Noise Impact: Planning Guidelines for Local Agencies." EPA's use of the referenced HUD document is based upon an analysis of the materials contained therein and does not preclude later modification of the compatibility criteria as new information becomes available. The key elements of the compatibility vs. noise level data base are contained in Table 1 of Appendix A. The noise resulting from aircraft operations is the noise level computed in terms of the annual average daily level of operations at the facility.

1. *All airports with a community impact boundary noise level of 65 L_{dn} or over at any point on the boundary.* At a minimum, these airports should require takeoff and landing noise abatement procedures for aircraft using their facilities and limit such aircraft to those meeting 1969 FAR 36 noise levels. The one exception to this minimum acceptable plan should be where the proprietor is able to reduce the community impact boundary level below 65 L_{dn} using other abatement measures which he finds more acceptable.

If these other measures do not reduce the community impact boundary level to below 65 L_{dn}, then at a minimum the proprietor should require takeoff and landing noise abatement procedures and exclude the use of non-FAR 36 aircraft. Having determined the community impact boundary level resulting from the implementation of an approvable plan under this regulation, the airport proprietor shall use whatever addditional available abatement measures are necessary to maintain no greater than this level in the future.

2. *Airports with community impact boundary levels of less than 65 L_{dn} at all points on the boundary.* At a minimum, these airports should use whatever available abatement options are necessary to maintain the community impact boundary level now existing and to reduce it further if this is possible.

3. *Airports which contemplate expansion of their facilities.* At a minimum, these airports should maintain their community impact boundary level after expansion at a level which is no greater than that which represents the level necessary for an acceptable plan prior to expansion.

4. *New airports.* At a minimum, these airports should be designed and developed so that at no time in the future will the community impact boundary noise level exceed 65 L_{dn}.

In the development of noise abatement plans pursuant to this regulation, special attention should be focused on those airports which are so severely impacted that they have community impact boundary noise levels of 75 L_{dn} or over. This situation can have such a serious impact on the health and welfare of the population exposed to such levels that every reasonable effort should be made to reduce this level to under 75 L_{dn} as soon as possible.

As an immediate objective, EPA believes that every airport with a community impact boundary level in excess of 75 L_{dn} should reduce that level to less than 75 L_{dn} as soon as possible but in any case by the end of 1980 unless this would impose a severe hardship. In EPA's view such a severe hardship would exist only in the event that (1) the less than 75 L_{dn} goal cannot be met fully without the purchase of land; (2) such purchase is not covered by the 1970 Airport and Airway Development Act (ADAP), as amended or, (3) such extra-ADAP purchases are not reasonably possible in relation to the airport proprietor's financial capability, the amount of litigation damages which the purchase would diminish, and the excess in purchase price over the recoupment value of converting the land to a compatible use.

In summary, the EPA believes that as a longer-term objective, all airports should work toward bringing their community impact boundary levels down below 65 L_{dn}. Furthermore, in those cases where community impact boundary levels are at 75 L_{dn} or above, a serious problem exists which calls for immediate and forceful action.

It is generally agreed that 75 L_{dn} is an unacceptable exposure level for people in normally constructed homes. 65 L_{dn} was chosen as a longer-term objective because present limited data indicate that at some airports, a contribution of noise from aircraft of less than 65 L_{dn} is difficult to distinguish from other ambient noise, given the environmental noise levels around those airports. However, as indicated in "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With An Adequate Margin of Safety" (EPA 550/9-74-004, March 1974), effects from noise occur at levels below L_{dn} 65 and further analysis is needed in the future to refine further practical objectives for airport noise abatement.

PUBLIC HEARING AND EVALUATION OF THE PLAN

Upon completion of the draft Airport Noise Abatement Plan, the proprietor of an airport (or the State, if the proprietor is a political subdivision thereof) is required by this proposed regulation to hold a public hearing to afford all interested persons an opportunity to submit data, views, and comments with regard to the merits of the draft implementation plan for that airport.

Based upon the record of the hearing, the draft plan is, to the extent practicable and necessary, to be changed by the proprietor of the airport to reflect the views, data, and comments received at the hearing. The revised plan will then be forwarded to the Administrator of the FAA.

If the Administrator does not notify the airport proprietor of his disapproval of the plan, the plan is then automatically incorporated as submitted into the Airport Operating Certificate for that airport. Notification of disapproval will be made within 120 days of the date of receipt of the plan by the FAA. The Administrator may disapprove any plan on the basis of (1) safety, (2) significant disruption of the national air transportation system, or (3) evidence that the plan has not been the subject of adequate public participation.

If the Administrator is considering a disapproval action, he may ask the airport proprietor for any additional pertinent information which is needed to clarify those issues which are being considered as the basis for disapproval. Such a request will stop the running of the 120-day period which will then begin to run again as soon as the additional information is submitted. This request and the submission of new information does not authorize an additional period of 120 days; the intent rather is to allow the proprietor to gather and submit new information without this period of time being counted against the 120-day review period.

If the Administrator intends to disapprove a Plan, he will publish in the FEDERAL REGISTER a notice of his intention to disapprove the Plan, setting forth his reasons for such disapproval and inviting comment. The Administrator must also notify directly those persons who testified at the local hearing. Thereafter, the Administrator will either withdraw his disapproval of the Plan or direct the airport proprietor to prepare a revised

plan to overcome the adverse findings of the Administrator.

COMPLIANCE

If the plan is not disapproved within 120 days, the plan automatically is incorporated as an amendment to the Airport Operating Certificate for that airport. The regulation requires that the airport proprietor must then implement this plan. Each such plan will be in effect for no more than five (5) years. The Plan must be revised and the revision submitted to the Administrator for review no later than one (1) year prior to the termination date of the original plan. The first such revision is due four (4) years after incorporation of the original plan in the operating certificate. The Administrator may suspend the Airport Operating Certificate if at any time the airport proprietor does not carry out the abatement plan as so incorporated. During such suspension the Administrator may limit operations at the airport and no ADAP funds may be expended or obligated in connection with the airport except for noise planning or abatement purposes.

Failure to comply with the provisions of this regulation within a reasonable time under the circumstances will be deemed by the Administrator to constitute a denial by the airport proprietor of "fair consideration" to the communities in or near which an airport development project may be located, within the meaning of the Airport and Airway Development Act, so as to constitute the basis for denial of grant approval for airport development projects under that Act.

Airport Noise Abatement Plans required by this regulation must be submitted in a phased schedule between January 1, 1978 and July 1, 1979 pursuant to a schedule developed and published by the Administrator of the FAA.

Any action taken by the Administrator of the FAA pursuant to the requirements of this regulation which relate to the disapproval of an Airport Noise Abatement Plan, or the publication of general guidelines or regulations affecting noise planning and abatement at airports, will be taken after consultation with the Administrator of the EPA.

All airports subject to this regulation must develop plans which meet the health and welfare standard of this regulation on a time-phased basis with the first target no later than two (2) years and the second target five (5) years from the date of submission. In addition, each plan is required to project population changes and noise impact for 10 years after submission and display alternatives available to local communities for land use controls.

(Secs. 313(a), 611(c), and 612, Federal Aviation Act of 1958, as amended (49 U.S.C. 1354 (a), 1431(c), and 1432); 6(c), Department of Transportation Act (49 U.S.C. 1655(c)); Title I of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.); and Executive Order 11514, March 5, 1970.)

In consideration of the foregoing, it is proposed to amend Subchapter G of the Federal Aviation Regulations (14 CFR Chapter I) to establish a new Part 140 to read as follows:

SUBCHAPTER G—AIR CARRIERS, AIR TRAVEL CLUBS, AND OPERATORS FOR COMPENSATION OR HIRE: CERTIFICATION AND OPERATIONS

PART 140—AIRPORT NOISE ABATEMENT

Sec.

140.1 Applicability.
140.2 General requirement.
140.3 Noise level information.
140.4 Airport noise abatement plan.
140.5 Action of the administrator.
140.6 Termination of plan.
140.7 Revision of plan.
140.8 Effect of failure to comply with this part.
140.9 Failure to comply with plan.

Appendix A—Airport Noise Evaluation Process (ANEP).

AUTHORITY: Secs. 313(a), 611(c) and 612, Federal Aviation Act of 1958, as amended (49 U.S.C. 1354(a), 1431(c), 1432); sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c)); Title 1, National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.); Executive Order 11514, March 5, 1970.

§ 140.1 Applicability.

The provisions of this part apply to each airport proprietor subject to part 139 of this title.

§ 140.2 General requirement.

Pursuant to sections 611 and 612 of the Federal Aviation Act of 1958, the Administrator of the Federal Aviation Administration shall require that each airport proprietor must obtain an Amended Airport Operating Certificate which is an amendment to the existing Airport Operating Certificate, to include an Airport Noise Abatement Plan as provide in this part.

§ 140.3 Noise level information.

Each airport proprietor shall submit to the Administrator within 120 days a report prepared in accordance with Appendix A showing the boundary line noise levels ofits airport. The Administrator shall publish this information in the FEDERAL REGISTER.

§ 140.4 Airport noise abatement plan.

Each airport proprietor shall submit to the Administrator on dates to be set by the Administrator (in no case earlier than January 1, 1978, nor later than July 1, 1979) an Airport Noise Abatement Plan, prepared in accordance with the requirements of this section.

(a) Each Plan prepared under this section shall be developed according to the Airport Noise Evaluation Process (ANEP) specified in Appenix A to this part, and shall detail the proprietor's consideration of all available abatement options. All airports subject to this regulation must develop plans which protect the public health and welfare taking into consideration the factors prescribed by section 611(d) of the Federal Aviation Act as amended on a time phased basis with the first target no later than two (2) years and the second target five (5) years from the date of submission. In addition, each plan shall project population changes and noise impacts for ten (10) years after submission and display alternatives available to local communities for land use controls.

(b) Each airport proprietor (or the State if the airport proprietor is a political subdivision of a State) shall, after preparing a Plan meeting the requirements of paragraph (a) of this section prior to submission to the Administrator, conduct a public hearing on the Plan to afford all interested persons an opportunity to submit data, views, and comments with regard to the merits of the draft noise abatement Plan for that airport.

(1) The proprietor shall, no later than one year prior to the date that his initial plan is to be submitted to the Administrator, cause to be published a notice in newspapers and other media of the communities affected by the airport which sets forth his proposed procedure for developing the plan, including the approximate date of the public hearing.

(2) Such hearing shall be conducted in the manner of an informal hearing in accordance with procedures described in § 11.67 of this chapter.

(3) Copies of the draft Plan shall be made available to all interested parties no less than 45 days before the hearing is held.

(c) Based upon the record of the hearings, the draft Plan shall, to the extent practicable and reasonable, be changed by the proprietor of the airport to conform with the views, data, and comments received at the hearing.

(d) The submission of the final Airport Noise Abatement Plan to the Administrator shall include the following:

(1) The Plan, as revised under paragraph (c) of this section.

(2) The record of the hearing held under paragraph (b) of this section;

(3) A list of the parties, and their addresses, who participated in the hearing held under paragraph (b) of this section;

(4) A synopsis of the views presented at the hearing;

(5) The proprietor's comments on the views presented at the hearing.

§ 140.5 Action of the administrator.

Except as otherwise provided in this section, the plan as submitted will be automatically incorporated into the Airport Operating Certificate for each airport for which an Airport Noise Abatement Plan has been properly submitted in accordance with § 140.4(d).

(a) The Administrator will publish in the FEDERAL REGISTER a notice of the incorporation of such plan into an Airport Operating Certificate under this part.

(b) At any time within 120 days following receipt by the Administrator of an Airport Noise Abatement Plan properly submitted in accordance with § 140.4(d), the Administrator may notify the airport proprietor that he intends to disapprove such Plan.

(1) The Administrator may disapprove any Plan if he determines that the Plan

(i) May create a safety hazard, or

(ii) May significantly disrupt the national air transportation system, or

(iii) was submitted without adequate public participation as required by § 140.4(b).

(c) If the Administrator determines that a Plan should be disapproved, he shall publish in the FEDERAL REGISTER his intention to disapprove the Plan, setting forth his reasons for such a determination, and inviting comment.

(1) Within 10 days after publication of any notice under this subsection, the Administrator shall notify directly each party who participated in the public hearing held by the airport proprietor of his determination and invite comment.

(2) The Administrator may at his discretion hold a public hearing for the purpose of receiving views and comments of interested persons in connection with any Plan disapproval. Any such hearing will be conducted by the Administrator as an informal hearing in accordance with the rules of conduct prescribed in § 11.67 of this chapter.

(3) Based upon review of all comments received, the Administrator shall either withdraw his notice of his intent to disapprove or shall direct the airport proprietor to prepare a revised Plan to overcome the adverse findings of the Administrator.

(d) At any time during the 120-day period prescribed in paragraph (b) of this section, the Administrator may request the airport proprietor to submit any additional information which is reasonably necessary to clarify those matters specified in paragraph (b) (1) of this section which may serve as a basis of the Administrator's disapproval. The period of time required by the airport proprietor to furnish this data shall not be counted in determining whether the 120-day period specified in this section has elapsed.

(e) Any actions by the Administrator of the FAA under this section or in the form of general guidelines or regulations affecting noise planning or noise abatement at airports, shall be taken only after consultation with the Administrator of the Environmental Protection Agency or his designee.

(f) Once a plan is incorporated as an amendment to the Airport Operating Certificate the airport proprietor shall implement the plan in accordance with the schedule included in the plan. The airport proprietor may revise his plan by submitting a new plan to the Administrator pursuant to § 140.4.

§ 140.6 Termination of plan.

(a) Each Airport Noise Abatement Plan terminates whenever the Airport Operating Certificate is terminated, surrendered, or revoked as provided in Part 139 of this chapter.

(b) Unless earlier terminated under paragraph (a) of this section each Airport Noise Abatement Plan terminates five years from the date of incorporation of the plan in the Airport Operating Certificate under § 140.5. Termination of the Noise Abatement Plan shall result in the termination of the Airport Operating Certificate.

§ 140.7 Revision of plan.

The Plan must be revised and submitted to the Administrator for review no later than one (1) year before the termination date of the original plan. The first such revision is due not later than four (4) years after incorporation of the original plan in the Airport Operating Certificate. This revision shall include a full description of the relationship of this plan to areawide planning in land use and transportation which has been carried out in neighboring communities. Each revision is subject to all requirements of this part.

§ 140.8 Effect of failure to comply with this part.

Failure to comply with any provision of this part shall be deemed by the Administrator to constitute a denial by the airport proprietor of "fair consideration" to the communities in or near which an airport development project may be located within the meaning of the Airport and Airway Development Act, so as to constitute the basis for denial of grant approval of an airport development project under that Act.

§ 140.9 Failure to comply with plan.

The Administrator may suspend the Airport Operating Certificate at any time that the airport proprietor does not carry out the abatement plan as approved. During such suspension the Administrator may limit or otherwise control operations at the airport and no ADAP funds shall be expended or obligated in connection with the airport except for noise planning or for noise abatement purposes.

APPENDIX A—AIRPORT NOISE EVALUATION PROCESS (ANEP)

1. DEFINITIONS

Sound exposure level (L_{AE}), in decibels, is the level of the time integral of A-weighted squared sound pressure, with reference to the square of the standard reference sound pressure of 20 micro pascals and a reference duration of one second.

Equivalent continuous sound level (L_{eq}), in decibels, is the A-weighted mean square sound pressure level over a stated time period.

Day-night average sound level (L_{dn}), in decibels, is the 24-hour average sound level, from midnight to midnight, obtained after adding 10 decibels to sound levels in the night from midnight to 7 a.m. and from 10 p.m. to midnight (0000 to 0700 and 2200 to 2400 hours).

Indigenous sound level, in decibels, is the day-night average sound level normally associated with activities and sources common to residential neighborhoods, in the absence of aircraft noise and the noise generated by major freeways, trains, industries, or other specific sources.

Background sound level, in decibels, is the common logarithmic sum of indigenous sound level and the contribution to day-night average sound level provided by all other residential noise sources other than aircraft. If other sources in the residential area do not exist, or are disregarded, the background sound level is equal to the indigenous sound level.

Incremental aircraft impact, in decibels, is the positive arithmetic difference between background sound level and the common logarithmic sum of aircraft and background sound levels where that sum is computed on the following scale:

Aircraft Sound Level Less Background Sound Level	Value added to Background Sound Level to Determine Common Logarithmic Sum of Aircraft and Background Levels
10 or more	10 or more
9	10
8	9
7	8
6	7
5	6
4	5
3	5
2	4
1	4
0	3
-1	3
-2*	2

* The cut-off at - 2db is utilized because this is considered as the minimum value where recognition of aircraft noise can be identified as a contributor to total noise, i.e., aircraft plus background.

Gridpoint array is the format used to display aircraft day-night average sound levels and consists of a cartesian grid system of uniformly spaced points; aircraft average day-night sound level is computed at each point of the cartesian grid and so displayed.

Gridblock is the land area bounded by 4 gridpoints which form a square, the sides of which are parallel to the axes of the cartesian grid system.

Gross study area is the land area enclosed by a line which connects the gridpoints of an aircraft day-night average sound level gridpoint array printout which are nearest to 55 L_{dn} but which do not exceed 55 L_{dn}.

Net study area is the land area included within the gross study area which is exposed to an incremental aircraft impact.

Airport boundary line level, in decibels, is the aircraft average day-night sound level on the line established by the land held in fee simple by the airport.

Community impact boundary line is the line established by the land (a) which is now used and can reasonably be expected to continue to be used in a way which is compatible with the noise levels to which it is exposed or (b) for which the development rights have been purchased such that only development compatible with the noise levels to which it is exposed is allowed. Land which is merely zoned for compatible use or for which avigation easements have been purchased and on which incompatible land use is possible is not included. Compatibility is determined according to Table 1 of this Appendix.

Homogenous development is defined as land in residential use upon which there is a uniform spacing of residential structures of a similar type.

Noise units are calculated by taking the product of incremental aircraft impact in a specific area and the residential population of that area.

Potential noise units are calculated by taking the product of incremental aircraft impact in a specific area and the population which would reside in that area if undeveloped property were to be developed in a manner consistent with its principal permitted use, pursuant to local land controls, control policies or use plans.

Undevelopable property is land which cannot be built upon because of permanent physical or legal constraints, e.g., held in fee, flood plains, land subject to use easements, restrictive covenants or lease-hold agreements by governmental entities for public purposes having the same effect as permanent open space restrictions.

Undeveloped property is land which is developable, but which has shown a 10 to 15 year history of stability, i.e., an absence of zoning changes, plating or subdivisions, water, sewer and utility extensions, building permit applications, and the existence of tax assessment valuation consistent with permitted use.

Developing property is land with a 10 to 15 year history of instability, as evidenced by the same public record criteria used to define undeveloped land.

2. PURPOSE

It is the purpose of this part to establish a uniform methodology for Aircraft Noise Evaluation in the vicinity of airports, including the determination of Boundary Line L_{dn} Levels. Such methodology employs a prescribed set of noise descriptors which are used to determine cumulative aircraft noise levels, for boundary line assessments, and to compare cumulative aircraft noise levels with activities indigenous to affected communities, for assessment of Aircraft Incremental Impact. All airport noise abatement plans prepared pursuant to the Airport Noise Regulation shall employ this methodolgy, or its equivalent, for the characterization of aircraft noise impact.

3. NOISE DESCRIPTORS

(a) *Single Event.* The sound exposure level (L_{AE}) shall be employed for the analysis and characterization of single aircraft noise events.

(b) *Cumulative events.* The day-night average level (L_{dn}) shall be employed for the analysis and characterization of multiple aircraft noise events and for the estimation of community indigenous and/or background noise levels. Multiple aircraft events are analyzed in terms of an annual average daily number of operations.

(c) *Incremental aircraft impact.* The positive arithmetic difference between background sound level and the common logarithmic sum of aircraft and background sound levels. Aircraft sound levels are considered to provide an increment to background sound levels when the aircraft level exceeds the background level by an increment at which recognition of aircraft noise can be identified as a contributor to total noise.

4. DETERMINATION OF AIRPORT BOUNDARY AND COMMUNITY IMPACT BOUNDARY L_{dn} VALUES

To provide the public with an indication of the extent of the noise impact of an airport, the proprietors of all civil air carrier airports, i.e., those airports which hold a current Airport Operating Certificate under Part 139 of the Federal Aviation Regulations, shall determine their airport boundary line L_{dn} values at a sufficient number of points on thetir boundary line so as to be able to certify that said levels are nowhere in excess of 65 L_{dn} or that said levels do exceed 65 L_{dn} and likewise for L_{dn} 75. At any boundary line where L_{dn} values exceed 65 L_{dn}, the proprietor shall determine the Community Impact Boundary Line and identify land which is exposed to greater than L_{dn} 65 and to greater than L_{dn} 75 which is not contained within the Community Impact Boundary Line. Proprietors may further specify what portions of this latter land is zoned for compatible use. Table 1 of this Appendix presents compatible use information for several land uses as a function of L_{dn} levels for the purpose of identifying the Community Impact Boundary line and land zoned for compatible use.

Airport boundary line level and Community Impact Boundary line designations shall be submitted to the Administrator within 120 days of the date of promulgation of this regulation. Said designations and declarations shall be submitted together with copies of the working materials and data used to develop them, as described below.

Boundary line L_{dn} levels shall be determined according ot the data and methods presented in "Calculation of Day Night Levels (L_{dn}) Resulting From Civil Aircraft Operations," (GPO No. ------) and shall explicitly follow the techniques described in Section III of the referenced document, "Calculation of L_{dn} Values at a Point" where all such points lie on the boundary line. At a minimum, L_{dn} values shall be determined for the intersection of each extended runway centerline and boundary line; L_{dn} calculations shall be performed at a sufficient number of points between the intersections of the extended runway centerlines and boundary lines to enable the proprietor to certify that boundary line levels either do or do not exceed 65 L_{dn} and likewise for L_{dn} 75.

5. INCREMENTAL AIRCRAFT IMPACT

When required by this regulation, the Incremental Aircraft Impact methodology shall be used to determine the extent and severity of aircraft noise problems in the vicinity of civil aviation airports, as well as the effectiveness of noise impact reduction options. The methodology consists of a series of subtasks, as described in the following subsections.

COMPATIBLE MARGINALLY COMPATIBLE

LAND USE	DAY-NIGHT AVERAGE SOUND LEVEL IN DECIBELS 50	60	70	80
Transient Lodging				
Office Buildings, Personal, Business and Professional				
Commercial-Retail, Movie Theaters, Restaurants				
Commercial-Wholesale, Some Retail, Ind., Mfg., Utilities				
Livestock Farming, Animal Breeding				
Agriculture (Except Livestock), Mining, Fishing				
Public Right-of-way				

Source: Adapted by R. W. Young from Figure 2-15 of HUD Report TE/NA-472 November 1972 "Aircraft Noise Impact: Planning Guidelines for Local Agencies" by Wilsey & Ham and Bolt Beranek and Newman.

A. *Defining the study area.* The IAI methodology operates on two distinct data bases which are used to characterize (1) the population distributions and demographics in the vicinity of the airport and (2) the aircraft operations at the airport; Each of these data bases is used to determine a "noise picture" of the area around the airport, one for non-aviation sources and the other for aviation sources. A comparison of the two noise pictures leads to a determination of the noise impact of aviation sources, over and above non-aviation sources. Hence, it is desirable to define a study area which is large enough to permit the evaluation of all potentially feasible aviation noise reduction options while minimizing the need to continually acquire additional information for the population distribution and demographics data base. For this reason, the proprietor shall define a Gross Study Area which includes all land exposed to an Aircraft Day-Night Average Sound Level of 55 L_{dn} or greater. Said definition is to be made in terms of annual average daily airport activity levels and mode of operation for the twelve (12) month period prior to the date of promulgation of this regulation, except where the designated 12-month period includes major disruptions to the normal operation and activity of the airport such as reduction of activity levels due to strikes or other abnormal service reductions or modifications such as those imposed by runways closings for resurfacing. Should the 12-month period prior to the date of promulgation of this regulation include such service abnormalities, the proprietor shall use data for the 12-month period prior to the beginning of the service abnormality. The 12-month period used to define the Gross Study Area is hereafter referred to as the Base Year.

For the Base Year, the proprietor shall acquire the aviation operations data necessary to develop a Gridpoint Array using an FAA approved L_{dn} computer program,[1] or its equivalent, or, for smaller airports, the manual technique presented in "Calculation of Day-Night Levels (L_{dn}) Resulting From Civil Aircraft Operations." Although the specific details of alternative equivalent L_{dn} calculation programs may require that data be put into specific formats, all such calculation programs require the same functional types of data which are as follows:

A map of the airport and its environs at a scale of 1 inch to 2000 feet indicating runway length, alignments, landing thresholds, takeoff start-of-roll points, airport boundary, and flight tracks out to at least 50,000 feet from the end of each runway.

Airport activity levels and operational data which will indicate, on an annual average daily basis, the number of aircraft, by type of aircraft, which utilize each flight track, in both the day (0700–2200 hrs.) and night (2200–0700 hrs.) periods for both landings and takeoffs.

For landings—glide slopes, glide slope intercept altitudes, and other pertinent information needed to establish approach profiles, i.e., the relationship altitude to distance to touch-down along with the engine power levels needed to fly that approach profile.

For takeoffs—the flight profile which is the relationship of altitude to distance from start-of-roll along with the engine power levels needed to fly that takeoff profile; these data shall reflect the use of noise abatement departure procedures and the takeoff weight of the aircraft or some proxy for weight such as stage length.

Existing topographical or airspace restrictions which preclude the utilization of alternative flight tracks.

The Government furnished data depicting aircraft noise characteristics.

The Base Year airport activity and operations data and the aircraft noise emission characteristics, when processed by an approved L_{dn} calculation program or the referenced manual technique, will yield aircraft L_{dn} values in the vicinity of the airport in a geographical gridpoint array. The gridpoint array shall be at a scale of 1 inch to 2,000 feet with a uniform spacing of 1,000 feet between gridpoints. The gridpoint array is normally centered on the runway complex; however, for facilities which exhibit a preponderence of operations over specific area adjacent to the airport, the gridpoint array center should be translated toward that area in order to include all impacted areas while excluding areas over which there is minimal aircraft activity.

B. *Determining the gross study area boundary.* The gross study area boundary is that line which includes all land area exposed to 55 L_{dn} or greater due to aircraft operations. This boundary is determined by connecting the line of gridpoints which are nearest to 55 L_{dn} but which do not exceed 55 L_{dn}. The gross study area is then composed of all gridblocks which are intersected by or lie within the connecting line.

C. *Determining the locus and extent of authority.* The gross study area may fall completely within the boundary of a single political jurisdiction which has comprehensive land use planning and control authority or it may be composed of a variety of governmental entities. The airport proprietor shall identify and depict the geographic extent of each governmental entity which is either wholly or partially contained within the Gross Study Area and describe the land use planning and control authority available to each. The description of planning authority shall be of sufficient detail to distinguish between comprehensive or master planning authority and other types such as areawide, regional, special purpose.

An acceptable analysis of the types of land use control available to the impacted jurisdictions should include, but not be limited to, the following general categories of land use control:

Acquisition and disposition of land;
Regulatory (police) power;
Capital improvement programs;
Monetary and fiscal policy; and
Contractual agreements.

For prospective applications of local land use control authority, the airport proprietor shall indicate whether the specified authority is (1) as a matter of administrative discretion, (2) pursuant to the enactment of a local law, or (3) as requiring State enabling legislation.

D. *Estimating community background levels.* The community background level is the common logarithmic sum of the indigenous (self-generated) noise level and the contributions of other specific residential sources such as limited access highways which are within the gross study area. Background levels must be estimated in a manner which is methodologically compatible with the format of the aircraft noise analysis, i.e., background levels must be presented in L_{dn} at each gridpoint in the array which was defined for the aircraft noise analysis.

1. *Estimating indigenous levels.* Indigenous levels shall be estimated for all residentially developed areas within the gross study area. The data requirement for this task consist of (1) a base map of the area surrounding the airport to the same scale as the Aircraft Day-Night Average Sound Level Gridpoint Array (1 inch to 2000 feet), (2) up-to-date aerial photography of the area surrounding the airport, and (3) up-to-date census data and tract maps on population and housing for the gross study area. The selection of a 1 inch to 2,000 foot scale reflects the wide availability of U.S. Geodetic Survey (USGS) and Census maps which are produced in that scale. Aerial photography is not an absolute necessity for airports which are not located within built-up areas; in such cases an existing land use map or physical survey may be used. However, in built-up urban areas the use of aerial photography is advised to determine population densities and land use characteristics for given census tracts. These materials are basically all that are necessary to perfrom the indigenous noise estimation part of impact methodology. However, any additional material such as land use surveys and maps and population and housing surveys and analyses can be used as a supplement to the census information. Census tracts will vary considerably in size throughout urban and rural areas and any additional information on population and where it is actually within tract boundaries will enable more precise calculation of indigenous levels.

In order to estimate indigenous levels, the gross study area must be subdivided into study units which are areas of homogenous residential development. The following items constitute the basic criteria for study unit definition.

A study unit shall be residential development of homogenous density throughout. Residential development is categorized into three separate groups; single unit detached dwellings uniformly distributed, multi-family dwellings uniformly distributed, and a uniformly distributed mix of single and multi-family units.

The boundary of a study unit shall follow the physical boundary of a homogeneous development category.

The maximum geographical size of a study unit shall be the census tract boundaries in which the development category lies.

The minimum geographical area for a study unit of homogenous density in built up urban areas shall be 10 acres (built up is defined as development of homogeneous density which is surrounded by other land uses).

The maximum range of aircraft day-night average sound levels in a study unit shall not exceed 10 db.

Indigenous noise may be estimated as a function of population density for each study unit using the following equation:

$$L_{dn} = 10 \log p + 22$$

Where p=population density, people/square mile or p=Study unit population/study unit area in square miles, and the population may be computed by a physical inspection of the number of dwellings within a study unit and multiplying it by the average number of people per dwelling within the census tract which contains the study unit; if the study unit boundary and the census tract boundary are the same, total population may be directly determined from the census data.

The EPA has identified a minimum criteria level of 55 L_{dn} as being adequate to protect the public health and welfare with an adequate margin of safety and for those study units which due to sparse population do not exhibit an indigenous level of 55 L_{dn}, the estimated level is disregarded and 55 L_{dn} is assigned for the purposes of this study as the

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[1] Two computer programs are now in general use for L_{dn} calculations, the AMRL program was used in the development and testing of this regulation.

"Community Noise Exposure Resulting from Aircraft Operations: Computer Program Operator's Manual," AMRL TR 73–108, Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, July 1975.

"Airport Noise Reduction Forecast, Volume II—NEF Computer Program Description and User's Manual," Department of Transportation, DOT–TST–75–4, October 1975.

indigenous level. This procedure applies to any area with a population density of less than 2,000 people per square mile.

2. *Noise from other sources.* The community background level is composed of indigenous noise and the noise contribution from other sources within the community such as freeways and industrial sites. Prediction of noise levels resulting from sources may be done on a site specific basis, based upon measured data and put into the L_{dn} gridpoint format according to the following formula:

L_{dn}=10 log 1/24 (15 antilog L_{eq} day+9 antilog (L_{eq} night+10)

where L_{eq} day and L_{eq} night are the equivalent average sound levels in the day and night periods, 0700–2200 hrs. and 2200 hrs. to 0700 hrs. respectively.

For arterials and freeways approaching design hour volumes, the following formula can be used:

$$L_{dn}=30-30 \log D$$

where D is the distance from the near lane in miles and the equation does not reflect the influance of highway configuration or local topography.

Estimation of the contribution of other noise sources within the community is a potentially complex and time consuming effort. Thus, this methodology leaves that effort to the discretion of the proprietor and allows indigenous levels to be used in lieu of background levels. The use of indigenous levels in lieu of actual background levels yields an optimistic, i.e., low side, estimate of community levels without aircraft noise and hence provides a high side estimate of aircraft impact. Since the formulas specified above are not capable of reflecting the exact physical situation corresponding to specific unique sites, measured background noise levels may be substituted for calculated values when such measurements are available and the proprietor must substitute such measured values where he has reason to believe that the estimation technique yields highly inaccurate levels for a particular land area. Although such measured levels may be more accurate than estimated levels, it is EPA's judgment that the estimated values are generally accurate enough for the use to which they are put in this noise evaluation process—namely, to identify this priority areas for noise abatement and the relative effectiveness of abatement options. The estimation methods may be refined in time as more data become available.

3. *Background levels for undeveloped areas.* Undeveloped property which is within the gross study area must be viewed within the context of constituting a potential noise problem. Once land has been categorized as undeveloped but developable, a determination should be made of the principal permitted use under existing land use regulations. Such information may then be combined with the three development categories to define discrete study areas and assign "potential" population to appropriate gridblocks. This information will be of use in the evaluation of noise abatement options which may shift noise impact to such areas as well as aiding in the evaluation of land use control policies which may be used to preclude development in noise impacted areas. Potential noise impacts shall be evaluated for the time frame 10 years in the future, as required by this regulation.

4. *Determining incremental aircraft impact and noise units.* At this stage of the analysis, several data sets and displays have been produced:

A base map which shows airport configuration and flight tracks (1 inch to 2000 feet)

A gridpoint array of aircraft average day-night sound levels, with gridpoints every 1000 feet, presented at a scale of 1 inch to 2000 feet

A second map, also at 1 inch to 2000 feet which shows the study units, defined according to the criteria in Section B.1.

Indigenous sound levels for each study unit

Sound level contributions of other residential sources; this is optional and may be neglected at the discretion of the airport proprietor

The first step in the combination of the above listed materials to determine Incremental Aircraft Impact and Noise Units is to formulate Community Background Levels from Indigenous Levels and Other Residential Sources at each gridpoint.

The Community Background Level at a gridpoint is the common logarithmic sum of the Indigenous Level at that gridpoint and the contribution of Other Residential Sources at the same gridpoint. If the analyst elects to exclude Other Residential Sources, the Community Background Level at a gridpoint is identical to the Indigenous Level at that gridpoint.

The analyst now has a Community Background Level and an Aircraft Average Day-Night Level for each gridpoint in the airport vicinity.

For each study unit which contains two or more gridpoints, Community Background Level, referred to the study unit, is the arithmetic mean of all gridpoint Community Background Levels contained in the study unit. If the analyst has excluded the contribution of Other Residential Sources, the study unit Community Background Level is identical to the study unit Indigenous Level.

The study unit Aircraft Average Day-Night Level is determined by taking the arithmetic mean of all aircraft gridpoint levels within the boundary of the study unit. Where a small study unit does not have a gridpoint within its boundary, the aircraft gridpoint value at the gridpoint nearest to the study unit boundary is adopted as the study unit aircraft level.

For each study unit, the analyst now has developed a Community Background Level, an Aircraft Average Day-Night Level, and, from the earlier computation of indigenous noise, the study unit population.

The Total Noise Level for a study unit is the common logarithmic sum of the Community Background Level and the Aircraft Average Day-Night Level of the study unit.

The Incremental Aircraft Impact, in a study unit, is the positive arithmetic difference between the Total Noise Level and Community Background Level.

The Noise Units, in a study area, are determined by multiplying the Incremental Aircraft Impact in the study area by the residential population of the study area.

The step by step process described herein is summarized in the following example for a study unit:

LCB=LI+LORS—Lorgarithmic sum
LT=LCB+LA—Logarithmic sum
IAI=LT−LA—Arithmetic Difference
NU=IAI×P—Simple Multiplication

where LORS=Other Residential Sources Level, db

LI=Indigenous Level, db
LCB=Community Background Level, db
LA=Aircraft Level, db
LT=Total Level, db
IAI=Incremental Aircraft Impact, db
P=Population
NU=Noise Units

The information developed in the preceding series of steps should be retained in a tabular form, by study unit, since the later analysis of noise abatement options, leading to an Airport Noise Abatement Plan, will compare future situations to the existing Base Year case. Further, while the total number of Noise Units around an airport is taken as the most aggregated metric for the severity of the noise impact situation, the less aggregated results, i.e., results by study area, are the most useful in actually determining the effectiveness of specific noise abatement options.

5. *Analysis of program alternatives.* The preceding section prescribes a methodology for the characterization and presentation of the aircraft noise impacts which result from an existing set of airport operating conditions and land development configurations. The objective of the Airport Noise Regulation is to reduce the existing noise impact problem and it is probable that the airport proprietor may find it necessary to consider a fairly large number of abatement strategies comprised of different combination of options in order to demonstrate that his noise abatement plan is optimal. Noise abatement options should be considered and presented according to the following categorization:

Noise abatement options for which the airport proprietor has adequate implementation authority.

Noise abatement options for which the requisite implementation authority is vested in a local agency, governing body, or state agency or governing body.

Noise abatement options for which requisite authority is vested in an agency of the Federal Government.

The minimization of Base Year Noise Units can be achieved through actions considered discretionary to the Federal Aviation Administration or the airport proprietor or pursuant to FAA approval or discretionary to State or local governing bodies. At a minimum, the proprietor should analyze the following options, subject to the constraint that the option is appropriate to the specific airport, i.e., evaluation of night curfews is inappropriate if there are no night flights. Even though the airport proprietor responsible for the plan cannot require the FAA or State or local governing bodies to take certain actions which might have a positive noise abatement benefit for the airport, the proprietor must analyze and make available for review the effect which such actions would have on the noise impact from the airport. At a minimum, the following options should be analyzed and displayed.

1. Takeoff and landing noise abatement procedures for aircraft.
2. Limitations on the use of aircraft which do not meet the certification noise limits of Federal Aviation Regulation Part 36.
3. Noise abatement preferential runway systems.
4. Glide slopes and glide slope intersections for landing configuration.
5. Flight tracks.
6. Approach paths.
7. Landipg paths.
8. Limitations on the class of aircraft using the airport.
9. Shifting aircraft to neighboring airports.
10. Location of run-up areas.
11. Operational limitations/curfews.
12. Priority landing directions for all aircraft.
13. Landing fees based on performance specifications.
14. Landing fees based on noise emission characteristics.
15. Compatible use of impacted land.
16. Other actions which would have a beneficial impact on public health and welfare.
17. Other actions recommended for analysis by the FAA or EPA for the specific airport.

The set of noise abatement options and strategies which will meet or exceed the health and welfare standard of the regula-

tion shall be presented to the public as a proposed noise abatement plan, subjected to areawide public hearings and delivered to the Administrator of the FAA. Such plans must include the following:

The impact of current operations on the surrounding community.

The effect of the proposed plan on reducing noise impact in the surrounding community for time frames of two (2) and five (5), and ten (10) years from the date of submission, given reasonable assumptions concerning the future operations at the airport and projected population changes in the community.

The relative contribution of each of the proposed options to the overall effectiveness of the plan.

Land use alternatives available to local and State authorities.

A schedule for implementation of the proposed noise abatement plan.

The FAA has not received from the Environmental Protection Agency an inflationary impact assessment for the recommended regulation set forth in this notice.

Issued in Washington, D.C., on November 12, 1976.

CHARLES R. FOSTER,
Director of
Environmental Quality.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[Docket No. 16279; Reference Notice No. 76-24]

AIRPORT NOISE REGULATORY PROCESS

Public Hearing

The Federal Aviation Administration will hold a public hearing January 17, 1977, on proposed amendments to the Federal Aviation Regulations (14 CFR Chapter I) submitted to the FAA by the Environmental Protection Agency (EPA) under section 611(c)(1) of the Federal Aviation Act of 1958, as amended by the Noise Control Act of 1972 (Pub. L. 92-574). This hearing will afford interested persons the opportunity to present views, data, and arguments regarding the substance and issues raised in the proposals contained in Notice 76-"Airport Noise Regulatory Process" (published elsewhere in this issue of the FEDERAL REGISTER).

The hearing will be conducted in the Auditorium on the 3rd Floor of the Federal Aviation Administration Building, 800 Independence Avenue, SW., Washington, D.C., convening at 9:00 a.m. In the event that response to this notice exceeds the time allotted to the hearing, it will be continued at 9:00 a.m., January 18, 1977, in the FAA Auditorium.

The hearings will be informal in nature and will be conducted by a designated representative of the Administrator under 14 CFR 11.33. At the hearing, FAA spokesmen will make a brief opening statement regarding the proposals contained in the notice. Since the hearings will not be evidentiary or judicial in nature, there will be no cross-examination or other adjudicatory procedure applied to the presentations. However, interested persons wishing to make rebuttal statements will be given an opportunity to do so at the conclusion of the presentations in the same order in which initial statements are made.

Interested persons are invited to attend the hearings and to participate by making oral or written statements concerning the respective proposals. Written statements should be submitted in duplicate and will be made a part of the regulatory docket. Persons wishing to make oral statements at the hearings must notify the FAA that they desire to be heard, and indicate the amount of time requested for their initial statements. Presentations will be scheduled on a first-come-first-served basis, as time may permit. Requests to be heard should be addressed: "Public Hearing on Notice No. 76-24, Attention: Mr. Laurence J. Aurbach, Chief, Public Liaison (AEQ-120), Office of Environmental Quality, Federal Aviation Administration, 800 Independence Avenue SW., Washington, D.C. 20591; or telephone: (202) 426-8724.

In addition to material presented for the purpose of the hearings, persons not participating in the hearings are invited to submit relevant written comments to the regulatory docket established for the notice of proposed rule making. As stated in the notice, such written comments should identify the notice or docket number and be submitted in duplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket, AGC-24, 800 Independence Avenue SW., Washington, D.C. 20591. The closing date for submitting written comments is March 24, 1977. All comments will be available for examination in the FAA Rules Docket both before and after the closing date for comments.

Notice No. 76-24 was issued by the FAA in accordance with section 611(c)(1) of the Federal Aviation Act of 1958, as amended by the Noise Control Act of 1972 (Pub. L. 92-574). The notice contains recommended regulations submitted to the FAA by EPA to provide such control and abatement of aircraft noise as EPA determines is necessary to protect the public health and welfare. The notice presents EPA's analysis of the background of the respective proposals and contains the material that is the subject of the public hearings. While all relevant comments are of interest, the FAA specifically invites relevant statements or comments concerning the following:

(a) Available data relating to aircraft noise, including the results of research, development, testing, and related evaluation activities.

(b) The views and positions of other Federal, State, and interstate agencies.

(c) Whether the proposed regulations would be consistent with the highest degree of safety in air commerce and air transportation in the public interest.

(d) Whether the proposed regulations would be—

(1) Economically reasonable;

(2) Technologically practicable; and

(3) Appropriate for the particular types of aircraft, aircraft engines, appliances, or certificates to which they would apply.

(e) The extent to which the proposed regulations would contribute to providing protection to the public health and welfare by carrying out the purposes of section 611 of the Federal Aviation Act of 1958, as amended.

(f) The overall environmental impacts of the proposed regulations (including environmental factors other than noise).

(g) The economic (inflationary) impact that might result because of adoption of the proposed rules.

Before taking further action under 611(c) of the Federal Aviation Act of 1958, the FAA will consider all statements presented at the hearings and all written statements and comments submitted to the regulatory docket. The specific terms and substance of proposals contained in the notice may be changed in the light of those statements and comments presented.

Transcripts of the hearings will be made and anyone may purchase copies from the reporter. A transcript of each hearing will be available for examination in the Rules Docket.

(Secs. 313(a), 611(c), 612, Federal Aviation Act of 1958, as amended (49 U.S.C. 1354(a), 1431(c)), 1432; Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)); and 44 U.S.C. 1508.)

Issued in Washington, D.C., on November 12, 1976.

CHARLES R. FOSTER,
Director of Environmental Quality.

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